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In the United States Patent and Trademark Office Patent Application Transmittal

Transmitted herewith for filing is the Patent Application of:

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For: Files Transfer Between a Remote Home Server and a Local Server

Enclosed are

- 14** pages of specification, including **8** claims, plus sheets of **4** drawings.
 X An assignment of the invention to International Business Machines Corporation, Armonk, New York 10504.
 X A certified copy of a/an **European** application.
 X Declaration and Power of Attorney.
 PTO-1449 & references
 X A return post card
 Other:

Filing Fee Calculation (For Other Than Small Entity)

Basic Fee:					\$690.00
Claims Fees:	Filed	Limit	Extra	Rate per Extra	
Total claims:	8	20	0	\$18.00	\$0.00
Independent claims:	3	3	0	\$78.00	\$0.00
Multiple Dependent Claim Presented				\$260.00	\$0.00
Total					\$690.00

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FILES TRANSFER BETWEEN A REMOTE HOME SERVER AND A LOCAL SERVER

BACKGROUND OF THE INVENTION

1. Technical Field:

The present invention relates to files transfer between a remote server and a local server. Such a transfer is necessary when a user is temporarily connected to a local server different from a remote home server to which this user is usually connected.

2. Description of the Related Art:

It is now very common that someone who travels needs to have access to a set of files, system files, data files or application files. So, this person can bring a portable computer with him, all the necessary files being stored in this computer. It is often not very convenient to carry such an equipment. Moreover, nowadays, the files of a computer user are often stored on a server, the home server. In this case, the user has to transfer all his files on the portable computer and he can forget some of these files. Thus, solutions have been developed to allow a user to access transparently to his own computer from another personal computer, generally by means of a local server.

A first method, TELNET, allows a user connected to a network with a local computer to access a remote computer such that the local computer is a terminal of the remote computer. The term TELNET refers to a remote connection on the INTERNET that is made with the TELNET protocol. When using electronic mail or FTP, a file

transfer protocol, the local computer limits the interaction with the remote computer and the file management between both computers is not very practical. It is also possible to open an interactive session with TELNET. Accordingly, once the connection has been established, the local computer is transparent and the user works as if he were directly attached to the remote computer. During the session, both computers are connected, what means that access times could be long, especially when the remote computer is overburdened.

Another method is known as directory replication, a feature offered by servers equipped with MICROSOFT WINDOWS NT (registered trademark). Directory replication allows to set up and maintain identical directories on multiple stations such as servers or personal computers. Updates made to the files or directories on one server are periodically replicated to other stations in import directories. Replication is well adapted for read only files since import directories that receive copies of the files are overwritten each time replication occurs. Any modification made on a file in an import directory is lost at the next replication. Consequently, the user cannot be sure that the modifications he has made in an import directory will be saved; the saving procedure has to be done manually, by means of specific commands.

SUMMARY OF THE INVENTION

It is therefore a general object of the present invention to provide for a method which allows to access a file in a remote computer from a local computer in an efficient way and to insure that any modification of this file is saved.

According to the invention, in a remote computer, a method for providing a file comprises the following steps:

- receiving a request for this file,
- identifying this file as being stored in a distant server,
- requesting the distant server to send the file,
- identifying this file as being used, and
- forwarding this file.

Besides, in a local server, a method for transferring a file from a home server comprises the following steps :

- receiving a request for this file, this request comprising the home server identification,
- checking that this file is not locally stored,
- requesting this file to the home server,
- identifying the file as being locally used, and
- forwarding said file.

A method for sending back the file to the home server, wherein is stored an information according to which said file is locally stored, comprises the following steps :

receiving a request for this file, the request
comprising the home server identification,
checking that the file is locally stored,
forwarding the file to the home server when it
5 has been locally modified, and
deleting the information according to which
this file is locally stored.

Advantageously, this method comprises a further
10 step for sending an information to the home server when
the file has not been locally modified.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention are described below by way of example only with reference to the accompanying drawings, wherein:

Figure 1 represents the equipments involved in the invention,

Figure 2 represents the main components of a local file server,

Figure 3 represents the main components of a home file server,

Figure 4 is a diagram showing the messages exchange between the client, the local server and the home server, and

Figure 5 is a flow chart of the method used in the local server.

DETAILED DESCRIPTION OF THE INVENTION

With reference to **figure 1**, a personal computer or client **10** is connected to a local file server **11** by means of a local area network **12** itself connected to a wide area network **15**, generally with a router **14**. In addition, a remote home file server **17** is also connected to the wide area network **15** such as Internet either directly or through another router (not shown) and another local area network (not shown).

With reference to **figure 2**, the local file server **11** comprises a first LAN adapter, **21** where LAN means "Local Area Network". This adapter is used to transmit and receive messages on the network with the client **10** and with the home file server **17**. Another component of the local file server **11** is a first disk controller **22** such as a SCSI adapter (SCSI for "Small Computer System interface") or a RAID adapter (RAID for "Redundant Array of Inexpensive Disks"). The local server also comprises a first processor **23** to perform the method which will be described further.

The local file server **11** comprises in addition a first memory **25** which includes two specific tables, the local client table LT1 and the guest client table GT1. Each entry in these tables corresponds to a user and gives a pointer on one directory called the directory file.

With reference to **figure 3**, the remote home file server **17** is very similar to the local file server

11. It comprises a second LAN adapter 31, a second disk controller 32, a second processor 23 and a second memory 35. This memory includes also a local client table LT2, a guest client table GT2 and it further includes a remotely logged client table RT2.

With reference to figure 4, a file transfer between the home file server 17-402 and the client 10-400 will now be described. There is a set of messages between the client and the local server 11-401 and another set of messages between the local server and the home server. There is no direct exchange between the client 400 and the home server 402.

When the client or personal computer 400 is powered on, it first runs the BIOS program 403 stored in a read only memory located in a LAN adapter. The BIOS program performs a remote boot 406 on the local file server 401, using any usual protocol such as DHCP ("Dynamic Host Configuration Protocol") or BOOTP ("Bootstrap protocol"). The BIOS program sends a Connection request 404 to the local server 401 which sends back a login application 405. The adapter of the personal computer 400 uses a file transfer protocol such as TFTP ("Trivial File Transfer Protocol"), FTP ("File Transfer Protocol") or CIFS ("Common Investment File System") for downloading this login file from the local server 401. Subsequently, the personal computer 400 runs the login file which prompts a user of this computer to enter a user identification and eventually a password 407. The local file server 401 checks whether the user is one of its clients or not referring to the first local

client table **LT1 408**. Assuming the user is not one of its clients and is a guest, this user should be stored in the guest client table **GT1** if this not already done. The local server now requests the user to enter a home file server identification **409-410**. When this identification is received, the local server forwards **411** the client request to the home file server **402**. In response, the home server checks **412** that the user is one of its clients (referring to the second local client table **LT2** for instance) and acknowledges **413** the local server to accept this user. In addition, the home server informs the local server of the operating system files needed for this user. Usually, most of these files are available at the local server and therefore need not to be transferred between both servers. Eventually, the home server sends a file including user specific data. The local server can transfer the operating files to the client station **414** and the personal computer **400** can perform the loading of the operating system **415**.

Additional information on Internet protocols can be found in a IBM Company publication entitled : TCP/IP tutorial and technical overview GG24-3376-05, October 1998, edited by the International Technical Support Organization.

With reference to **figure 5**, a file transfer **50** is now described from the local server. First, a test **51** determines whether the client (user) using the client station is a guest or a local known client.

If the client is a local known user ("no"

answer), the requested file is simply transmitted to the client 54.

5 If the client is a guest and requests a new file transfer, the local server first checks 52 whether the file is in the local client directory or not by means of the guest client table GT1.

10 If the file is in the local server ("yes" answer), the local server sends the file to the client 54.

15 If the file is not in the local server ("no" answer), the local server requests the file to the home server 53, stores this file in its memory and its identification in the guest client table, and then forwards the file to the client. The files modifications made by the client on the personal computer are saved in the local server, what is state of the art. Moreover, an indication that the file has been modified is stored in the guest client table. According to an optional feature, this indication is also forwarded to the home server.

25 On the other hand, when this file is requested by the home server, the local server checks whether it has been modified or not.

30 If the file has not been modified (answer "no"), this information is forwarded to the home server.

If the file has been modified (answer "yes"), the modified file is forwarded to the home server.

In any case, the file is deleted and the identification of this file is removed from the guest client table GT1.

5 In the home file server 17, when a file has been requested by a first local server, or when according to the above mentioned optional feature a file is modified in this local server, a corresponding information is stored in the remotely logged client table RT2 together with the identification of the local server. 10 Thus, when later this file is requested again by the user from another server or from the home server itself, the home server first checks if it appears in the remotely logged client table RT2. If it is the case, this file is first requested to the local server identified in the table RT2 and it is overwritten on the version stored in the home server. The information according to which the file is in the first local server is then deleted in the remotely logged client table RT2.

20 It then appears that the latest version of the file is always available, either in the home server or in a server identified in a table of the home server.

25 The scope of the present invention is in no way limited to the above embodiments. In particular, any means or steps could be replaced by equivalent means, respectively steps.

CLAIMS

1 1. A method for providing a file comprising the
2 following steps:
3 receiving a request for said file,
4 identifying said file as being stored in a
5 distant server,
6 requesting said distant server to send said
7 file,
8 identifying said file as being used, and
9 forwarding said file.

1 2. A method for providing a file comprising the
2 following steps :
3 receiving a request for said file, said request
4 comprising a home server identification,
5 checking that said file is not locally stored,
6 requesting said file to said home server,
7 identifying said file as being locally used,
8 and
9 forwarding said file.

1 3. A method for providing a file, wherein is stored
2 information according to which said file is locally
3 stored when said file is received from a remote server,
4 said method comprising the following steps :
5 receiving a request for said file, said request
6 comprising said remote server identification,
7 checking that said file is locally stored,
8 forwarding said file to said remote server when
9 said file has been locally modified, and
10 deleting the information according to which
11 said file is locally stored.

1 4. The method according to claim 3 further comprising a
2 step for sending said information to said remote server
3 when said file has not been locally modified.

1 5. A server comprising means for carrying out the steps
2 of the method according to claim 1.

1 6. The server according to claim 5 comprising a
2 remotely logged client table for identifying where said
3 file has been forwarded.

1 7. A server comprising means for carrying out the steps
2 of the method according to claim 2.

1 8. The server according to claim 7 comprising a guest
2 client table for identifying to whom said file has been
3 forwarded.

**FILES TRANSFER BETWEEN A REMOTE HOME SERVER
AND A LOCAL SERVER**

ABSTRACT

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According to the invention, in a remote
computer 17, a method for providing a file comprises the
steps of receiving a request for this file, identifying
this file as being stored in a distant server 11,
10 requesting the distant server to send the file,
identifying this file as being used, and forwarding this
file.

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Further, in a local server 11, a method for
transferring a file from a home server 17 comprises the
steps of receiving a request for this file, this request
comprising the home server identification, checking that
this file is not locally stored, requesting this file to
the home server, identifying the file as being locally
used, and forwarding said file.

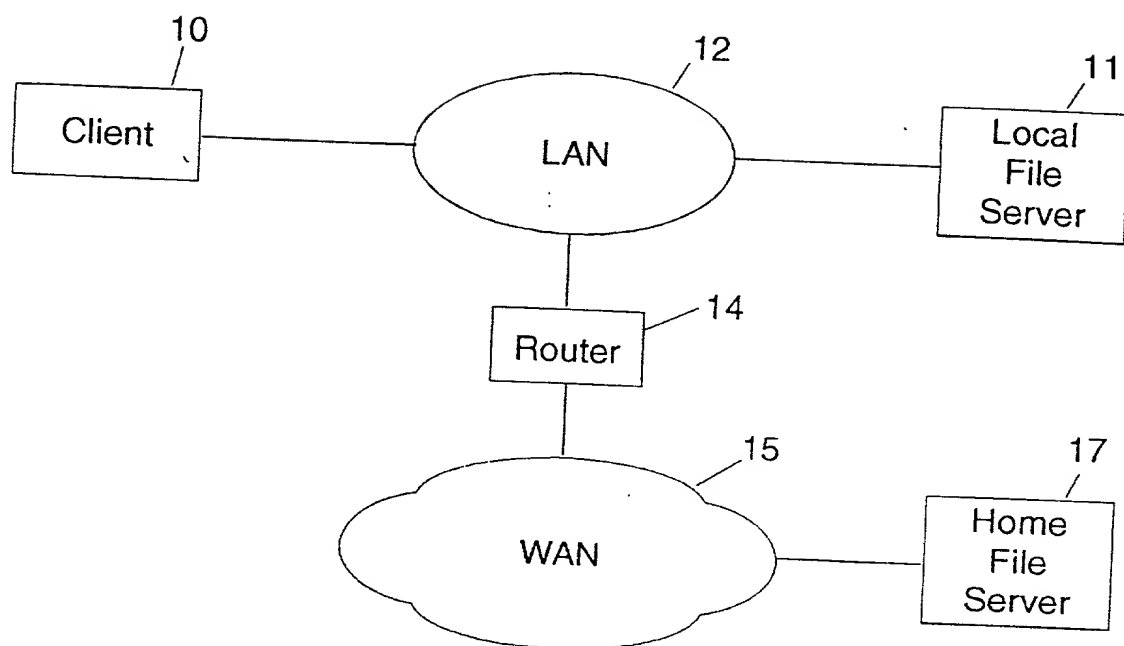


FIG. 1

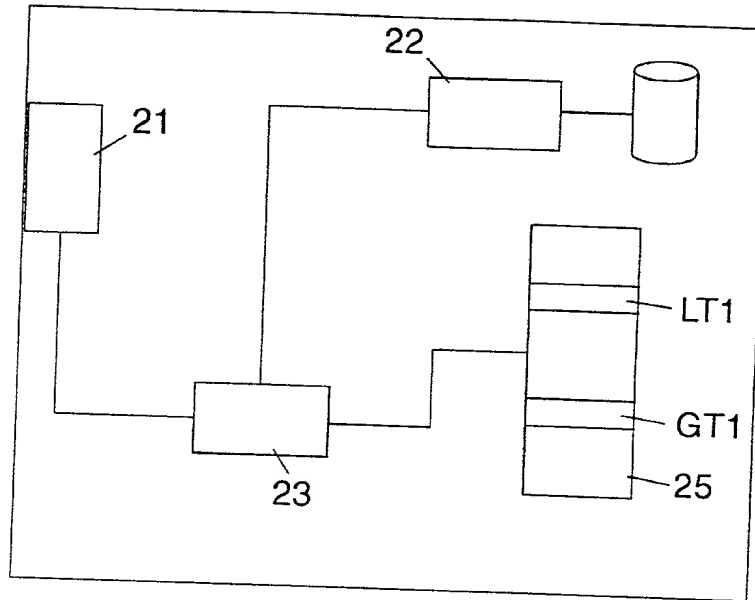


FIG. 2

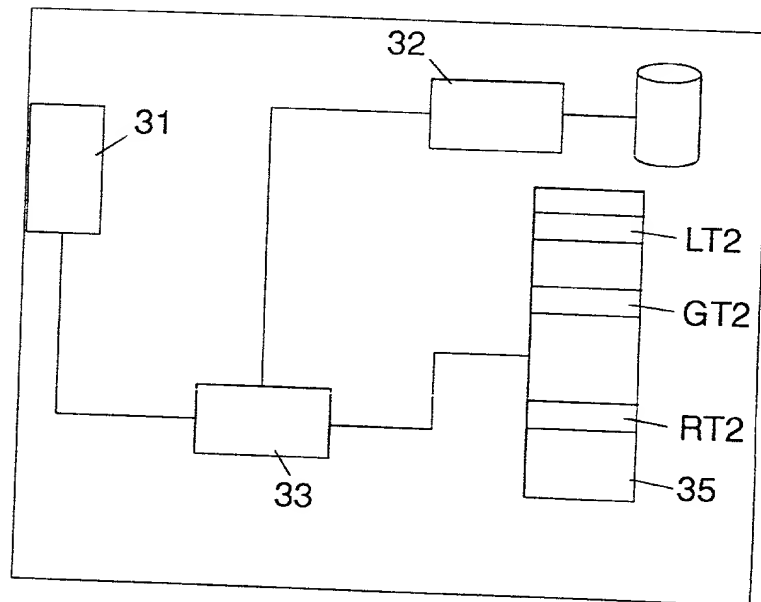


FIG. 3

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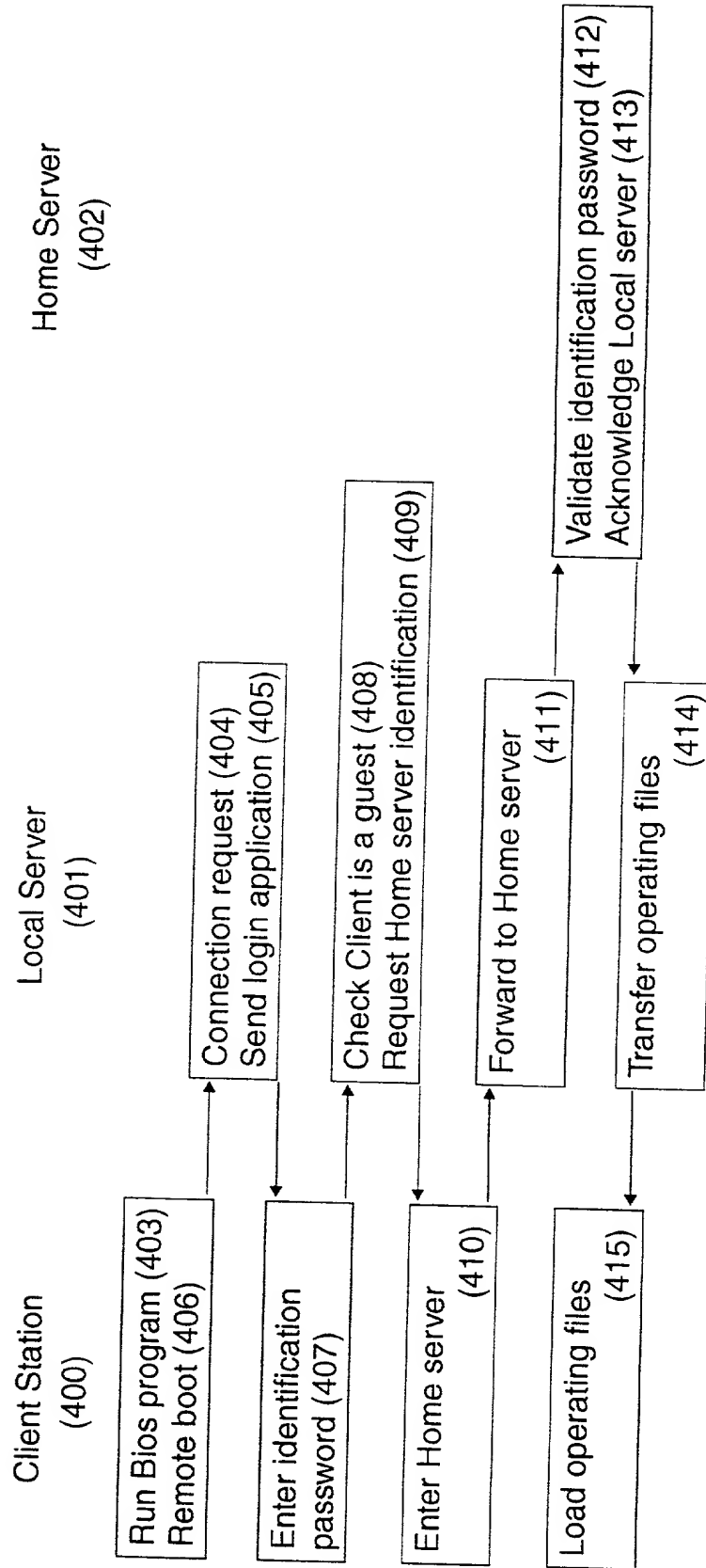


FIG. 4

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File Transfer from Local Server

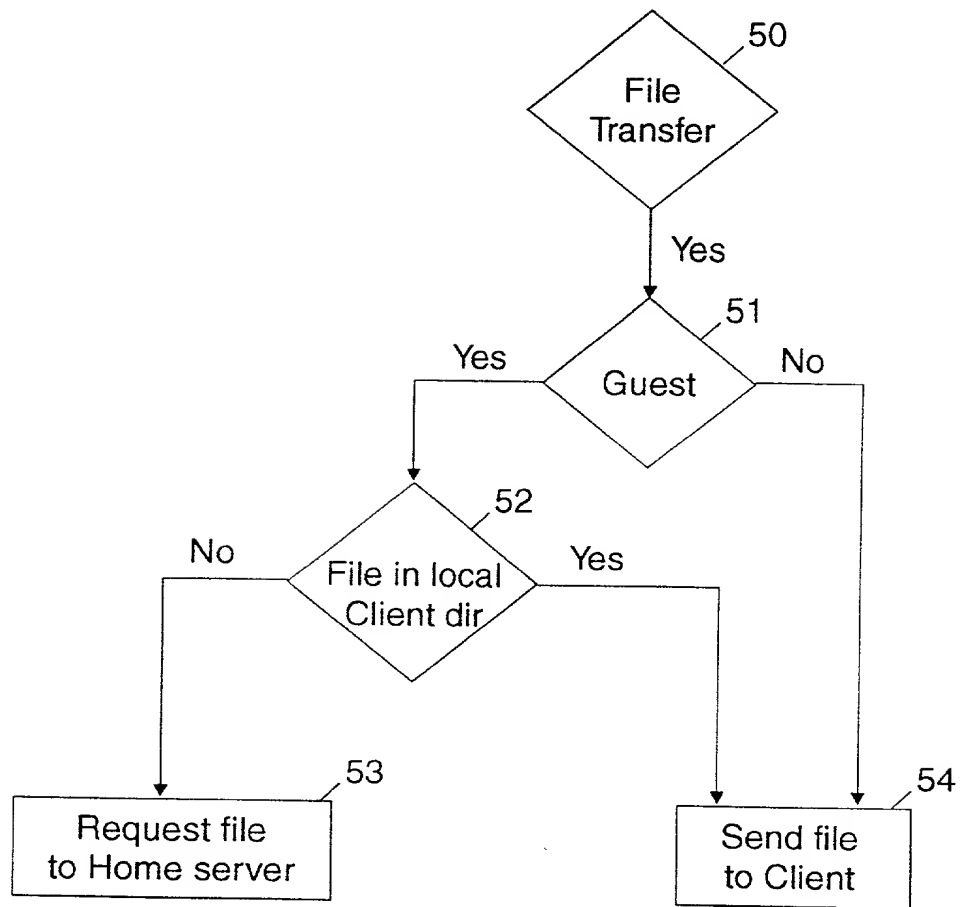


FIG. 5

**DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Files Transfer Between a Remote Home Server and a Local Server

the specification of which is identified by the attorney (IBM) Docket Number appearing above.

I hereby state that I have reviewed and understand the contents of the above- identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

<u>Number</u>	<u>Country</u>	<u>Day/Month/Year</u>	<u>Priority Claimed</u>
99480113.2	Europe	21/10/99	Yes

I hereby claim the benefit (a) under Title 35, United States Code, §119(e) of any U.S. application listed below and identified as a provisional application or (b) under Title 35, United States Code, §120 of any U.S. application listed below and not identified as a provisional application, and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior U.S. application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information material to the patentability of this application as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application

Prior U.S. Applications

<u>Serial No.</u>	<u>Filing Date</u>	<u>Status</u>
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

IBM Docket No. FR9-1998-0072 US1

As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Daniel E. McConnell, Reg. No. 20,360; Joscelyn G. Cockburn, Reg. No. 27,069; Horace St. Julian, Reg. No. 30,329; and Christopher A. Hughes, Reg. No. 26,914.

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